

### **Remarks**

Applicant respectfully requests reconsideration of this application. Claims 1-27 have been canceled. Claims 37-46 are withdrawn. Claim 28 has been amended. No claims stand allowed.

### ***Information Disclosure Statement***

Applicant wishes to disclose the status of other applications that may be considered related to the present application, as follows: serial no.: 10/315,624 (Office Action rejecting all pending claims mailed 12/11/07); serial no.: 10/315,694 (Office Action rejecting all pending claims mailed 06/30/08); serial no.: 10/367,178 (Office Action rejecting all pending claims mailed 04/25/08); serial no.: 10/889,326 (Office Action rejecting all pending claims mailed 05/05/08); serial no.: 10/608,594 (Office Action rejecting all pending claims mailed 08/07/08); serial no.: 10/618,931 (Office Action rejecting all pending claims mailed 08/07/08); serial no.: 10/367,197 (Office Action rejecting all pending claims mailed 05/01/08); serial no.: 10/395,749 (Final Office Action rejecting all pending claims mailed 07/16/08); and serial no.: 10/407,445. (Office Action rejecting all pending claims mailed 06/26/08). Applicant also wishes to disclose that in related application no. 11/800,543 an Office Action mailed 07/29/08 allowed claims 39-41 and rejected claims 10, 11, 14-17, 19-21 and 30-38.

### ***Traversal of Claim Rejections Under 35 U.S.C. § 102(e)***

Claims 28-30, 33, 34 and 36 stand rejected under 35 U.S.C. § 102(e) as being anticipated by Ganz et al. (US 6,584,080); "Ganz"). Applicant respectfully traverses this ground of rejection.

Ganz teaches a conventional radio communication repeater system in which each repeater is strictly limited to line-of-sight data transmissions with another

repeater. (See e.g., column 2, lines 48-55) Stated differently, Ganz fails to disclose or teach data transmissions to a next repeater that is physically obstructed from a line-of-sight view.

Furthermore, Ganz does not teach transmissions at a high data throughput. On the contrary, the system disclosed in Ganz is limited to transmitting simple webpage content at relatively low data throughputs of approximately 1-1.5 Mbps. For example, Ganz only teaches information throughput between repeater segments at 1.5 Mbps, equal to a full-dedicated T-1 line rate. (Column 8, lines 24-29) At this slow throughput rate, Ganz' system is incapable of sending and receiving real-time audiovisual content, which requires a throughput of about an order of magnitude greater than that disclosed in Ganz.

Because each and every limitation of the subject claims is not taught or disclosed by Ganz, Applicant respectfully contends that the subject matter of amended claims 28-30, 33, 34 and 36 is not anticipated.

### ***Traversal of Claim Rejections Under 35 U.S.C. § 103(a)***

Claims 31-32 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Ganz in view of Lau et al. (US 6,690,657 "Lau"). In addition, claim 35 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Ganz in view of Heinonen et al. (US 6,968,153 "Heinonen"). Applicant respectfully traverses this ground of rejection.

Lau teaches the user of low-power transceivers in channel-shifting RF repeaters to create a wireless network that can extend beyond each transceiver's useful range. A base station controls the allocation of time on one or more available channels between competing transmitters, and may also control the function of the channel-shifting repeaters. When a given transmitter is transmitting,

repeaters in range of that transmitter receive the signal, channel-shift the signal, and retransmit it. (Column 4, lines 6-19)

Lau, however, fails to teach or a first repeater in a chain transmitting during even time intervals and receiving during odd time intervals, the next repeater transmitting during the odd time intervals and receiving during the even time intervals, as recited, for example, in amended independent claim 1. Furthermore, Lau fails to teach pipelining transmissions from repeater-to-repeater in specific time intervals so as to maintain the efficiency of the throughput of the wireless network.

It should be understood that the multiple transmitters and receivers referred to by Lau are source and destination devices. This is explicitly disclosed in column 5, lines 11-15, which states, "Each T/R module is connected to at least one digital data device 60, 66, 72, 76, 82 (each device being a source and/or a sink of digital data)." Note that Lau teaches each repeater having two antennas, indicating that each of his repeaters has two independent RF transceiver subsystems, each for handling communications on a different frequency.

In addition, Lau discloses that his repeaters are receiving and transmitting *simultaneously*, which is contrary to the language of Applicant's amended claims. According to the amended claims, each data packet received by a repeater is re-transmitted during an interval delayed by one interval from an interval when the packet was received.

Lau's teaching of simultaneously transmitting and receiving data by his wireless repeaters is pervasive throughout his disclosure. For example, in column 6, line 25-31, he explicitly acknowledges that it may be necessary to "re-use" channels and that doing so creates a risk of feedback. The risk of feedback is precisely due to the fact that Lau's repeaters are receiving and transmitting at exactly the same time. This is the same effect one hears when a public address system microphone is placed in front of its speaker: since the audio signal (or RF

signal in Lau's case) is being transmitted at the same time it is received, the repeated transmission may be picked up again by the receiver and retransmitted once more, getting louder and louder, in an uncontrolled feedback loop.

To reiterate, Lau fails to teach, disclose, or suggest repeaters that do not transmit and receive at the same time; that is, repeaters that alternately transmit packets during even time intervals and receive packets during odd time intervals. In fact, Lau explicitly teaches away from the approach of the amended claims by disparaging systems that utilize CSMA/CA techniques, wherein one transceiver communicates with another transceiver on a channel only when the channel is not already in use (see column 2, lines 25-37). Instead, Lau teaches that the problems associated with such an approach are to be overcome through the use of repeaters having multiple transceivers that transmit and receive simultaneously on different frequency channels.

Ganz also teaches away from the claimed subject matter when he disparages half-duplex systems, i.e., systems that transmit and receive radio signals at mutually exclusive times, as suffering from "a reduction in throughput rate by a factor of two, since the repeater system must first receive signals from a host radio and then retransmit the signals to another repeater or a user." (Column 1, lines 16-24) As such, Applicant respectfully submits that prima facie obviousness is lacking with respect to claims 28-36. See e.g., *In re Haruna*, 249 F.3d 1327, 1335 (Fed. Cir. 2001).

Note that Ganz also teaches away from full-duplex systems such as that taught in Lau, wherein widely separated channel frequencies are required to effectively isolate data transmissions. (Column 1, lines 2-3) Lau understands and acknowledges this difficulty, wherein when an access point or repeater simultaneously transmits and receives on adjacent frequencies there is a problem with the transmitter saturating a nearby receiver. (See Figure 9, and Col 6 starting

on line 53.) For instance, Lau states (line 58): "The guard band allows a repeater (or T/R module) to transmit on one channel without saturating the receiver amplifier operating on the other channel, thus enabling simultaneous reception and transmission." Lau's assumes in establishing guard bands is that the repeaters and T/R's can frequencies can be selected arbitrarily so that the guard bands can use as little spectrum as possible (e.g. Fig 9 shows a guard band that is much narrower than the spectrum for either CH1 or CH2) . This flexibility is rarely the case, either in unlicensed ISM spectrum or in licensed cellular spectrum because to be compatible with existing 802.11x devices or existing cell phones, the current channel allocations must be utilized, and they generally are not allocated with guard bands.

Lau recognizes that such guard bands waste spectrum, and so he waves his hand at the problem and says in the next paragraph that "As more channels are added, it may be possible to decrease or eliminate the guard bands" and then describes a complex scheme that not only involves the aforementioned complexity of making sure no channel within range of another interferes very frequently with another, but adds the additional extreme complexity of having to guarantee separation between adjacent channels to avoid adjacent channel interference. (See Col. 7, line 12)

Given the disparate teachings of Ganz and Lau Applicant respectfully submits that a person of ordinary skill in the art would not have been motivated to combine the references in the manner suggested by the Examiner. Moreover, in view of the fact that Ganz disparages the approach favored by Lau and also teaches away from the subject matter defined by the amended claims, Applicant respectfully submits that a person of ordinary skill in the art would not have sought to combine or modify the cited prior art references since such a practitioner would

have had no reasonable expectation of success in achieving the invention to the subject claims.

Regarding claim 35, Heinonen likewise fails to teach receiving and transmitting at alternating or staggered time intervals. Heinonen instead teaches a Bluetooth repeater that may receive Bluetooth communications from an originating Bluetooth enabled device within range and then forward the same data to an intended recipient outside the range of the originating Bluetooth enabled device. Although Bluetooth is a radio frequency (RF) technology that operates at 2.4 GHz and is capable of transmitting voice and data, the effective range of Bluetooth devices is very short (e.g., 10 meters) and Bluetooth transfers data at the limited rate of about 1 Mbps, which is far less than what is needed for high-quality, high-bandwidth video transmissions using any known technology today, let alone at the time of Applicant's invention. Note that amended claim 1 recites a data rate of at least 11Mbps. Thus, Heinonen like Ganz, is incapable of transmitting real-time audiovisual content due to a restrictively slow throughput rate.

Heinonen also fails to teach any protocol or scheme for avoiding frequency interference so as to not compromise data throughput through the network. Rather, Heinonen's purpose is to extend the range of Bluetooth devices by use of standard repeaters, without any concern to the impact this extension of range would have on data throughput. Given that Bluetooth was designed for low-bandwidth devices (e.g., input peripherals and audio devices) this is a reasonable trade-off since maximizing throughput is rarely a concern for Bluetooth applications. But Heinonen's approach would necessarily defeat the throughput data rate of a wireless repeater network attempting to approach the maximum throughput that is available in the wireless spectrum. In other words, Heinonen fails to teach transmitting and re-transmitting packets at a data rate of 11Mbps or greater in a pipelined manner over a wireless network that includes a first access point and a

plurality of additional access points, as recited, for example in amended independent claim 1.

It should be noted that while the Figs. 1A and 1B of Heinonen bear visual resemblance to Figs. 2A, 2B in Applicant's specification, the meaning of the concentric circles is quite different. In Heinonen Figs. 1A and 1B, the small circle in the center identifies a wireless Bluetooth device, and the large circle, its area of *coverage* (the extreme range where data at any rate can be transmitted (or in other words, its range of *minimum* throughput) (see column 3, lines 39-60). This is distinguished from Applicant's disclosure, where in Figs. 2A and 2B the tiny square in the center identifies a wireless device, the small circle indicates its range of *maximum* throughput, and the large circle indicates its range where it causes interference to other wireless devices.

Heinonen tacitly assumes that the various Bluetooth devices will use frequencies which interfere with one another, and will utilize the protocols within Bluetooth for the various devices to share the channel. For example, in column 13, lines 56-59, he states:

In such an embodiment, a multitude of user devices can simultaneously send messages and the messages will be properly correlated by the Bluetooth repeater.

But Heinonen fails to teach or disclose how the simultaneous use of the channel by multiple uncoordinated devices can be achieved without reducing the throughput of the channel. Instead, Heinonen teaches away from maintaining a high data rate over a wireless network topology by disclosing the *opposite*: a system of repeaters for transmitting data at minimum throughput over an extended coverage range.

Applicant respectfully submits that a person of ordinary skill in the communications art would have understood that achieving a high specified data rate is largely irrelevant in the applications contemplated by Ganz and Heinonen.

Indeed, Heinonen's repeaters are designed to work at the maximum range of the Bluetooth devices, where the bandwidth is at its *minimum*. Furthermore, such a person would have appreciated that neither Ganz' system of line-of-sight repeaters nor Heinonen's system of Bluetooth repeaters would be capable of carrying real-time audiovisual content (e.g., HDTV video signals) at any rate approaching that of the subject claims. In other words, a person of ordinary skill in the art would have understood that adopting either Ganz' or Heinonen's approach -- or any combination of the two -- would render a wireless network transmitting media packets at a high rate essentially useless. A user watching HDTV programming on Heinonen's system would see the video stagger and sputter as the high bandwidth data pipeline was compromised with random and competing bandwidth demands on the repeater, as well as retries for colliding transmissions, resulting in an unusable television viewing experience. A person of ordinary skill in the art would therefore have been discouraged or dissuaded from attempting to achieve Applicant's claimed invention in view of any possible combination of Heinonen with Ganz.

Applicant respectfully submits that for all the reasons given above that a person of ordinary skill in the art considering the cited prior art references at the time of Applicant's invention would have not been led to, or able to achieve, the subject matter of Applicant's amended claims.

Accordingly, Applicant respectfully requests that the rejections under 35 U.S.C. § 103(a) be withdrawn. Applicant respectfully submits that all remaining claims are now in condition for allowance.


Please charge any shortages of fees or credit any overcharges of fees to our Deposit Account No. 50-2060.

Respectfully submitted,



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